
# St. MARY UNIVERSITY

## SCHOOL OF GRADUATE STUDIES

## DEPARTMENT OF PROJECT MANAGEMENT

# Causes of Project Delays in Grade One Construction Companies: The Case of Yotek Addis Ababa

**By**

**Habtamu Aregay**

**June, 2022**

**Addis Ababa, Ethiopia**

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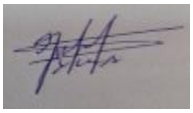
| Yilkal Wassie (Asst. Prof.) |  | 30/06/2022 |
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# DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the thesis itself**.**

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## Endorsement

With my consent as a university advisor, this thesis has been submitted to St. Mary's University's School of Graduate Studies for assessment.

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## ACRONYMS

| | |
|---|---|
| SPSS | Statistical package for social sciences |
| ANOVA | Analysis of variances |
| IV | independent variable |
| DV | dependent variable |
| VIF | variance inflation factor |

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# Abstract

*The purpose of this study was to Study Causes of Project Delay in Grade One Construction Companies: the case of Yotek Addis Ababa". Both descriptive and explanatory research designs were used for this study. Cross-sectional data were collected to address the research objectives of the study using a self-administered questionnaire for 65 employees using a stratified sampling and simple random probability sampling technique. The collected data were analyzed using descriptive statistics, and inferential (correlation and regression) analysis through the statistical package for social science (SPSS) version 16. The study used three major Causes of Project Delay factors including monitoring and evaluation, material-related factors, and project management-related factors as predictor variables, and successful project completion as the dependent variable. The finding of the research indicated that monitoring and evaluation, material-related factors, and project management-related factors have a positive and statistically significant impact on successful project completion. Finally, based on the findings of the study, recommendations were made for Construction Companies of Yotek: The most significant and influential variable affecting project completion time was found to be monitoring and evaluation, hence the project managers and clients should give their priority to improve the monitoring and evaluation strategies and techniques they use.*



**Keywords***: Causes, project, delay*

# CHAPTER ONE

# INTRODUCTION

## 1.1. Background of the Study

Construction plays an important role in the country; it brings great benefits to the country's economy, and it provides a developed and sustainable environment. As it can be seen, the built environment consists of infrastructure, commercial and industrial buildings, and housing (Grumberg, 1997) As a chronic and common problem worldwide, most construction projects suffer from schedule delays and construction projects (Chafi, 2020).

Due to different circumstances, delays vary by country, construction project, construction type, and construction cost (Sullivan, 1986). The construction industry is a valuable part of the world economy. The growth of the Ethiopian economy and population has brought a significant increase in the construction industry mainly in Addis Ababa and also regional capitals (Girma, 2016).

For a country like Ethiopia, the construction sector plays a major role in building infrastructure that unimaginably accelerates socio-economic progress. The construction of schools, health centers, hospitals, roads, and dams has a major impact on human development. On the other hand, it is undeniable that this sector has created thousands of jobs and has accomplished much in the fight against poverty.

Construction delays can be defined as delays in completing work compared to planned or contract schedules. Construction delays can only be minimized if the cause is identified (Kang, 2010). Delay is defined as delaying work without completely stopping construction work. This can result in timeouts beyond the contract date or the date agreed between the parties to implement the project (Tommy, 2006). Delays classify into non-excusable delays, excusable with compensable delays, excusable without compensable delays, and concurrent delays. Non-excusable delays are delays that the contractor causes or takes risks on their own. Excusable without compensable delays that may result from unpredictable circumstances, the contractor is not liable and may not be due to the contractor's fault or negligence, are tolerated without any permissible delay (Ahmed, 2003). An excusable with compensable delays is an excusable delay or interruption of all or part of the work caused by any act or omission by the owner due to a breach of the owner of the obligation specified in the contract

or the implied obligation. Or it is a break. Concurrent delays occur if both the owner and the contractor are responsible for the delay. Delay or Extension of Deadline: If the actual completion date of the work occurs after the agreed completion date, the contractor may extend the deadline and unless caused by the contractor's compliance will be liable for damages that notice from the contract and other requirements (Ahmed, 2003).

The construction industry is very large and complex and requires huge capital investment. Delayed completion of construction projects is one of the biggest problems facing the construction industry and can be a major problem for those involved in construction projects, costly disputes among those involved in construction, and can lead to harmful relationships.

This thesis assess the causes of project delay in the successful completion of a project in Yotek Construction. This was provide owners, Consultants, and contractors involved in construction projects on how to avoid delays can be developed in the future.

## 1.2. Statement of the problem

In construction projects, delay causing factors became the main problem for projects to extremely high cost, extended completion time, and inferior quality deliverables. Building construction projects are exposed to many problems during construction that lead to the unnecessary delay and unable meet the contract time of the projects (Kang, 2010)

Inaccurate time estimation, a weak economy, lack of managerial skills, low labor productivity, improper planning, slow decision making by owners, unrealistic imposed contract duration, contractor subcontracting, increasing prices of materials, environment, and others are main factors of delay in construction projects (Rabbani, 2011). Although efforts of the organization are visible, construction delay remains the main problem and various factors affect the accomplishment of projects as planned. The problem of project delay is still not solved even today when the technology is advanced and project management practices are more common than before (Yang, 2013)

The construction industry contains a large number of parties as clients, contractors, and consultants. This makes the industrial complex and the success of a construction project depends on its performance and is measured based on timely completion, within the budget, required quality standards, and customer satisfaction (Omran, 2012).

Construction projects have troubles with monitoring and evaluation, input/material related factors as well as project management related factors. In recent years, the delay of

construction projects is common in most civil engineering projects. Delays in a construction project are counted as a common problem and became a cause for project completion with a huge cost overrun (requiring a higher budget than estimated), extended completion time, inferior quality deliverables, and contract termination. The delays in construction projects happen because of various factors or causes. These causes lead to the delay in construction completion, and this delay ultimately leads to negative effects on the construction project. There are many building construction projects in Yotek construction, which suffered delays or in some cases suffered suspension or abandonment. This research is aimed at identifying the major causes of Construction project delay in Yotek Construction to accomplish the project in a short period of time to the desired purpose.

## 1.3. Research Objective

### 1.3.1. General Objective

The General objective of the study was to assess the causes of project delay in the successful completion of a project in Yotek Construction.

### 1.3.2. Specific Objectives

- To assess monitoring and evaluation related factors causing project delay in Yotek Construction.
- To examine input/material-related factors causing project delay in Yotek Construction.
- To assess project management related factors causing project delay in Yotek Construction.

## 1.4. Research Hypothesis

Based on reviewed literature the alternative research hypothesis is identified as follows.

- **Hypothesis 1 ($H_1$)**: Inadequate monitoring and evaluation are expected to affect the completion time of construction negatively.
- **Hypothesis 2 ($H_2$)**: Slow and late arrival of material/input has a negative impact on construction project delay
- **Hypothesis 3 ($H_3$)**: Inadequate project management and supervision by the contractor have an impact on construction project delay.

## 1.5. Scope and limitation

This research was comprised of Yotek Construction. The group of respondents for this research involved clients, consultants, and contractor companies that will be involved in Yotek Construction and are limited to three variables project knowledge management, monitoring and evaluation, input, and material factors in Yotek Construction.

The current stagnation of construction projects in Ethiopia will restrict the amount of data for sufficient research; furthermore, It was difficult to gather questions and undertake a thorough interview due to the busy schedules of the stakeholders moreover the pandemic was caused a major hindrance in conducting interviews and collecting sufficient data for the study. Likewise, some respondents will be hesitant, to tell the truth, or won't be fully cooperative in sharing the causes of delay in building construction projects.

## 1.6. Significances of the Study

There are several valuable benefits to be expected from conducting this study. It is important to identify issues related to delays in construction projects, especially among the project's key stakeholders, to provide better insight and understanding of the causes of delays, among contractors, clients, and consultants. This can be achieved by applying the theoretical concepts as described in this research to practice in real projects. It is hoped that these insights will guide efforts to improve the performance of the construction industry and help construction professionals. Therefore, these results may encourage practitioners to focus on lag issues that they may have encountered in current or future projects. In addition, this study aims to identify better methods and methodologies for implementing construction projects by minimizing the main causes of delays.

## 1.7. Organization of the thesis

Chapter one is an introductory part containing discussions on background, research problems, aim, and objective of the research, the significance of the research, scope, and limitation of the research, then lastly writes about the organization or layout of the research. Chapter two presents a literature review with general descriptions by different researchers on construction, contract, planning, control, and delay. Chapter three discusses the methodology employed in the study, including, research design, research approach, sample size, data source and collection method,. Chapter four described the presentation, analysis, and interpretation of the analyzed collected data through the proposed instruments, finally, chapter five presented

general conclusions and recommendations based on what is discussed in the previous chapters.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1. Theoretical overview

This part of the paper deals with a theoretical approach to investigating the meaning, causes, and implications of construction project delays. In addition, relevant studies in Ethiopia and other developing countries and their experience on the causes of construction delays are taken into account

### 2.1.1. Construction Projects

The term project has been defined by different scholars in a variety of ways. project is defined as "A project is a temporary endeavor undertaken to create a unique product, service, or result" (Görög, 2013). A project is a one-time, unique, multitask job with a definite starting point, definite ending point, a clearly defined scope of work, a budget, and usually a temporary team. In addition, projects need capital and commitment of other resources and most of the time involve conflict. A project is completed when its goals and objectives are accomplished to the satisfaction of the stakeholders and when objectives are attained (Görög, 2013). The construction industry is heterogeneous, enormously complex, sophisticated, and time-consuming undertakings. It is subject to the influence of highly variable and sometimes unpredictable factors. No two construction projects are the same, to a great extent each is unique, and no two jobs are ever the same (Odeh, 2002).

This part of the paper deals with a theoretical approach to investigating the meaning, causes, and implications of construction project delays. In addition, relevant studies in Ethiopia and other developing countries and their experience on the causes of construction delays are taken into account.

### 2.1.2. Definition of delay

Delay is a condition the actual work does not complete in an estimated time period. Delay is defined as a condition where a construction project does not complete within the designed time period. It happens when the work of contract does not complete in its prescribed time. Delay is a most common incident which occurs nearly in all the projects related to the construction industry (Muhammad, 2017).

In the context of building contracts, the term delay is used to indicate that the works are not progressing as quickly as intended and, specifically, that as a result completion may not be achieved by the completion date specified in the contract documents. (Chappell, 2008).
Delay could be defined as the time overruns either beyond the completion date specified in a contract or beyond the date that the parties agree upon for the delivery of a project (Ramya, 2015). Delay means delaying work without completely stopping construction, timed out beyond the contract date or the date agreed between the parties for the delivery of the project (Dinakar, 2014).

**Classification of delay**

Most importantly, delays can be seen in these four major categories as

1. Critical or Non-Critical.

2. Excusable or Non-Excusable,

3. Compensable or Non-Compensable

4. Concurrent or Non-Concurrent. (Trauner, 2009)

**Critical or Non-Critical Delays**

Critical delays are delays that prevent the contractor from finishing the work on the scheduled completion date as agreed upon in the contract whereas the noncritical delays do not affect the completion date of the project (Al-Najjar, 2008). This indicates that non-critical delays can be seen as those delays that do not impact the completion date of the project but in a way, affect the progress of the work. It can, therefore, be said that both excusable and non-excusable delays are critical delays.

Delays that affect the project completion or in some cases a milestone date are considered critical delays and delays that do not affect the project completion or a milestone date are considered non-critical delays. If these activities are delayed, the project completion date or a milestone later will be delayed. Determining which activities truly control the project completion date depends on the following: The project itself, the contractor`s plan and schedule (particularly the critical path), the requirement of the contract for sequence and phasing, the physical constraint of the project, i.e., how to build the job from a practical perspective (Dinakar, 2014).

**Excusable or Non-Excusable Delays**

Non-excusable delays are events that are within the contractor's control or that are foreseeable. The following are a few examples of inexcusable delays which are Late performance of subcontractors, Untimely performance by suppliers, Faulty workmanship by the contractor and subcontractors, and a project-specific labor strike caused by either the contractor's unwillingness to meet with labor representatives or by unfair labor practices (Trauner, 2009). The contractor or its suppliers are responsible for the inexcusable delay and they are entitled to accelerate their work done in the estimated time to pay compensation to the owner. The contractor compensates based on either liquidated damages or actual damages.

A project-specific labor stroke is caused by either the contractor's unwillingness to meet with labor representatives or by unfair labor practices. Excusable delays are occurrences over which neither the owner nor the contractor has any control, e.g. extreme weather conditions, acts of God, and other unforeseen future events (Jana, 2015).

**Compensable or Non-Compensable**

There is an inevitable delay if the contractor is entitled to financial recovery in the form of direct and indirect time-related costs resulting from the employer's risk event (Caletka, 2008). Inadequate drawings and specifications are the most prevalent source of compensable delay, but compensable delays may also result from the owner's inability to respond quickly to demands for details or shop drawings, owner's changes in design or materials, and owner's interruption and/or alteration in the job series (Al-Najjar, 2008). On the other hand, a non-compensable delay means that although an excusable delay may have occurred, the contractor is not entitled to any added compensation resulting from the excusable delay. Therefore, the issue of whether a delay should be covered must be resolved. A non-excusable delay also would not entitle you to extra credit or a time extension. Whether or not a delay is compensable is largely decided by the contract terms. In most cases, a contract outlines the types of delays that are non-compensable and for which the contractor does not receive any additional money but maybe allowed a time extension (Al-Gahtani, 2007).

**Concurrent or Non-concurrent parallel delay**

Concurrent or parallel delays occur when two or more independent delays occur in the same period. Concurrent delays are important when one is an employer's risk event and the other is a contractor's risk event, and the effects are felt at the same time. If two or more delayed

events occur at different times, but the mare's effects are felt (totally or partially) at the same time, this is more accurately referred to as the "Concurrent effect" of consecutive delayed events Increase (Caletka, 2008)

Concurrent delays are precisely described as different delays to the critical path that exist at the same time. Concurrent delays are also known as simultaneous delays, commingled delays, and entangled delays (Trauner, 2009). Concurrent delays are also known as overlapping delays (Levy, 2006).

### 2.1.3. Causes of Delay

In Ethiopia's construction sector, the traditional contract approach remains dominant, which could continue to be a trend. Ethiopia's Construction Sector includes clients or project owners, contractors, subcontractors, suppliers, and other key professionals responsible for planning and overseeing projects. These professionals include architects, engineers, and surveyors. Due to this mix of project participants, they are often in difficult situations and under some pressure.

All construction projects can be delayed and their importance varies greatly from project to project. Many researchers have investigated the causes of project delays in public works. The results of such studies have been validated for this study.

The causes of delays can be divided into eight main groups:1. Client-related factors include financing and payment of completed work, owner intervention, decision delays, and unrealistic contract terms by owners, 2. Contractor-related factors include site management, poor planning, poor contractor experience, construction errors, improper procedures, and subcontractor delays. Delays caused by subcontractors are one of the contractor's factors, as delays caused by subcontractors are entirely responsible for delays caused by subcontractors, 3. Consultant-related factors include long wait times for contract management, drawing and approval, quality assurance/control, and testing and inspection approval, 4. Key factors include quality and defects, 5. Labor and equipment factors include labor supply, labor productivity, equipment availability, and downtime, 6. Contractual factors include change requests, errors, and inconsistencies in contract documents, 7. Contractual relationships connect major disputes and negotiations under construction and all parties involved in the project. Includes poor organizational structure, and lack of communication between these parties, 8. External factors include weather conditions, regulatory changes, problems with neighbors, and on-site conditions (Hussien, 2002).

While traditional approaches to lag analysis tend to focus on the design and construction stages, delays and inefficiencies can often occur due to circumstances long before the first drawing is created. It is more difficult to identify these early factors as "delayed events", but common factors that can cause program-specific delays before the end of the first onsite delay event. Is as follows: poor project definition; use of an inappropriate form of contract; inappropriate contract packaging strategy; ambiguities present in specifications, contract drawings, bills, employer's requirements; the appointment of inexperienced managers and supervisors; insufficient budget allowances or contingencies (e.g. cost and time) for unforeseen events and design development; poor plant selection; failure to communicate plans/intentions to local authorities; ineffective site logistics planning; and/or Incorrect assumptions regarding neighboring sites, landowners, or other interested stakeholders. (Caletka, 2008)

Delay causing factors into seven major groups, these are owner contributed factors, contractor contributed factors, consultant contributed factors, materially contributed factors, equipment contributed factors, labor contributed factors and external factors (Dinakar, 2014). The contribution of the Contractor to the delay of the construction project is more than the client and consultant side. And the external factors contribute the least to the delay of a construction project. Improper communications between the involved parties are found as the major problem while external reasons like lack of qualified labor, equipment, and material when needed come next in the row.

Tthe causes and effects of delays in public construction in Jordan. They identified 55 delay-causing factors and grouped them into four categories: clients group, contractors group, consultants group, and external circumstances (Bekr, 2016). They conclude the research by identifying the top 10 most significant causes of construction delays for public sector projects: 1. Inadequate management and supervision by the contractor, 2. Client's changes of the design, 3. Inadequate planning and control by the contractor,4. Using the lowest bid that leads to low performance, 5. Changes in the extent of the project, 6. Errors in design and contract documents, 7. Progress payments are not made in time by the client, 8. Rework due to mistakes during construction, 9. Changes in the original design and 10. Low-level productivity.

The causes of delays in the construction industry in Slovenia classified into 11 groups and conducted an investigation (Jana, 2015). The results show that most delays are due to legal

issues, delays in decision-making by the owner or its agents, and plans that lack important details for the contractor. Many of the issues in these categories occur at the start of the project and can be mitigated (partially or completely) by the owner. Although their cost is by no means excessive.

Contractors' improper planning, contractors' poor site management, inadequate contractors' experience, inadequate clients' finance and payment for completed work, problems with subcontractors, shortages of material, labor supply, equipment availability and failure, lack of communication between parties, and mistakes during the construction stage are identified as major causes of project delay in the Malaysian construction industry (Sambasivan, 2007)

Conducted a similar study to determine the main causes of delays in building construction projects in Malaysia. Client-related causes, consultant responsibility, owner responsibility, and external causes are the four key categories highlighted. Delays in material delivery to the site, a shortage of material on-site, construction mistakes and defective work, poor labor skills and experience, a shortage of site labor, low labor productivity, financial issues, coordination issues with others, a lack of subcontractor skills, a lack of site coordinator's staff, poor site management, and a shortage of equipment and tools on-site are all client-related causes.

Financial difficulties and economic problems, late supervision and slow decision-making, slow to dive instructions, lack of material on the market, poor site management, construction mistakes, and defective work, delay in delivery of materials to the site, slow decision-making, lack of consultant experience, and incomplete documents were identified as the main causes of project delays in Malaysia building construction projects (Alaghbar, 2007) Shortage of material on the market, lack of equipment and tools on the market, bad weather, poor site condition (location, ground, etc.), poor economic condition (currency, inflation, etc.), and changes in laws and regulations are all external reasons

Depending on the type of construction procurement system used, the location of the project within the country, and the type of construction, the causes of project delays can differ from project to project within the country (Sambasivan, 2007).

The causes of Ethiopian construction delays were investigated by (Werku, 2016) Client-related, consultant/supervisor-related, contractor-related, designer-related, labor-related material-related equipment, and external-related elements are among the 88 delay-causing causes discovered.

As a result, the following are the key causes of project delays in the Ethiopian construction industry (Werku, 2016) Difficulties in financing projects by 1) contractor, 2) Escalation of materials price, 3) Infective project planning, scheduling, or resource management, 4) Delay in progress payments for completed works, 5) Lack of skilled professional in construction PM (project management) in the organization, 6) Fluctuating labors availability season to season/Seasonal labors availability, 7) Late delivery and shortage of materials, 8) low productivity of labor, 9) Unqualified/inadequate experienced labor, 10) Insufficient data collection and survey before the design

A study conducted in Kuwait, (Koushki, 2005) identified estimates of time delays and cost increases, as well as their causes. Changes in orders, financial restrictions, and lack of knowledge are the three main causes of delays. Contractor-related issues material-related issues, and owners' budgetary constraints are the top three causes of cost overruns.

The top ten factors causing delays for public sector projects in Jordan, , are (1) Inadequate contractor management and supervision, (2) Client design changes, (3) Inadequate contractor planning and control, (4) Using the lowest bid that leads to low performance, (5) Changes in the scope of the project. 6) Errors in the design and contract agreements, (7) The client's failure to make timely progress payments, (8) Rework due to construction blunders, (9) Changes to the original design and (10) Low productivity (Bekr, 2016).

### 2.1.4. Effect of Delay

Delays in construction project completion seem to be a perennial problem. When projects are delayed, they are either accelerated or have their duration extended beyond the scheduled completion date. Delays are usually accompanied by cost increases. The subject of delay has been addressed by several researchers and they found that delay always led to negative effects (Jacob, 2013).

The desire to finish a project on time, under the planned budget, and with the highest quality is a common goal for all contracting parties, including the owner, contractor, and consultant. Delay usually results in losses of one form or another for everyone the effects of construction delays on the project construction industry. The six effects of delay identified were: 1. Cost overrun, 2. Time overrun, 3. Dispute, 4. Arbitration, 5. Litigation and 6. Abandonment. (Sambasivan, 2007).

Cost and time overrun, compromised quality, arbitration, disputes, litigation, low-profit margin or financial loss, revocation of the contract, total abandonment of the project, and loss

of wealth and capacity as some of the effects of delays (Kakwasi, 2013). The most important delay effects in the construction industry of Pakistan are time overrun, cost overrun, abandonment, negotiations, court cases, and disputes (Haseeb, 2011).

The effects of construction delay on projects in the Niger Delta region of Nigeria. Seven effects of delay were identified which include: time overrun, budget overrun, poor quality completed project, bad public relations, arbitration, total abandonment, and litigation dispute and claims (Jacob, 2013).

The consequences of delay are different for different parties. The general consequences are the loss of wealth, time, and capacity. For the owner, a delay means the loss of income and unavailability of facilities. For the contractor, the delay means the loss of money for extra spending on equipment and materials and hiring the labor and loss of time. (Rabbani, 2011)

The study about causes, effects, and minimization of delays in construction projects concluded that time overrun and cost overrun is the top effects of delay (Divya, 2015). The study found that delays affect the disruption of work, loss of productivity, late completion of a project, increased time-related costs, third party claims, and termination of a contract.the team is hired, and work is going to be started. It involves managing teams effectively while achieving timeline expectations and reaching milestones of the project (Abdul-Rahman, 2006). It is the process group where most of the budget of the project will be utilized. Project Monitoring and controlling process group: It is a process group that is performed through a project's lifecycle. Monitoring and controlling include defending the project against scope creep, observing the project progress and performance, and providing corrective actions if there are any deviations from the plan. It involves tracking progress, comparing actual outcomes to the predicted outcome, analyzing variance and impacts, and also making adjustments. Monitoring and Controlling is where the project team can get back on track, compare the plan to actual, measure variance, and take corrective action. Project closing process group: It is a process group that involves conducting a project review for lessons learned, verification of the attainment of the project's objective and contractual closure, financial closure, and administrative closure is done.

## 2.1.5. Monitoring and Evaluation

### 2.1.5.1. Monitoring and Evaluation System

Monitoring and Evaluation (M&E) is a process that helps improve performance and achieve

results. Its goal is to improve current and future management of outputs, outcomes, and impact. The past, present, and future will be linked through this system. It is one of the most powerful tools that influence the performance of a project (Patrick, 2011). M&E is a key component of project management that gives control over the main parameters that define a project; scope, quality, resources, completion time, and cost (Kerzner, 2017) Basically, we start the M&E process by measuring actual performance, which is then compared against planned performance. If there is any deviation (or variance), we analyze the causes. We formulate corrective actions and implement them to correct the variance, then repeat the process by measuring the revised performance and comparing it to planned activities until there is no more (Levy, 2006)

### 2.1.5.2. Project Monitoring

Monitoring is collecting the necessary information with a minimum effort to make a routing decision at the right time (Patrick, 2011). The information gathered contains an important and necessary database for analysis, discussion, evaluation, and reporting. It is a regular and systematic process integrated into all the cycles of projects. It is a continuous function that aims primarily to provide project managers and stakeholders of an ongoing project with early indications of progress or lack thereof, in the achievement of project objectives. Monitoring is a broad management strategy aimed to see if programs are doing the right thing and are doing it right, to improve their quality. Good motoring is focused on results, records these results in reports, makes recommendations, and follows up with decisions and action. Its scope includes assessing the progress of projects and also providing managers with information that will be used as a basis for making decisions and taking action (Levy, 2006). The three primary elements associated with managing the construction project are quality, cost, and time (Geiger, 2010). These factors must be monitored throughout the duration of the job. Data for monitoring the project must be directly related to the project plans, outputs, schedules, and budgets, materials purchasing invoices, worker time cards, change notices, test results, and standards. Project monitoring tools and mechanisms include; field visits, annual project reports, outcome groups, and annual reviews monitoring involves repeated assessment of a situation over time. Having an initial basis for comparison helps you to assess what has changed over a while and if this is a result of the project's presence. So, you must have information about the initial starting point or situation before any intervention has taken place. This information is what is commonly known as the "baseline" of information. It is the line of the base conditions against which comparisons are made later on (Simon, 2013).

### 2.1.5.3 . Types of Monitoring

The types of monitoring include process monitoring, technical monitoring, assumption monitoring, financial monitoring, and impact monitoring. Process monitoring/ physical progress monitoring (Patrick, 2011). It involves routine data collection and analysis to establish whether the project tasks and activities are leading toward the intended project results. This kind of monitoring measures the inputs, activities, and outputs. It informs managers and owners of the project in keeping a check on whether activities in the project are up to schedule. Managing physical progress can be linked to managing time. Project outputs, Project inputs, Progress of the project according to objectives and the way the project is managed, and style of work are items to consider during physical progress monitoring. Project milestones are the simplest method for monitoring physical progress monitoring.

## 2.1.6. Knowledge Management of project

Several ideas and concepts of knowledge have been developed over recent years. Most approaches rest on the ideas of the resource-and knowledge-based view (Davenport, 1998). knowledge consists of frame experiences, values, contextual information, and expert insights which provide a basis for the evaluation and incorporation of new experiences and information (Davenport, 1998). knowledge management as a process of systematically and actively identifying, activating, replicating, storing, and transferring knowledge (Kotnour, 2000). They have developed a model of KM consisting of seven blocks: knowledge aims, identification, acquisition, development, distribution, use, and preservation. (Gupta, 2000) base their model of KM on the separation of implicit and explicit knowledge and identify processes of transformation between these two types of knowledge. In a process of socialization, tacit knowledge is transformed into new tacit knowledge; in the process of externalization, this tacit knowledge is transformed into explicit knowledge. The interaction of different kinds of explicit knowledge is called a combination**.** Explicit knowledge can then be transferred into implicit knowledge through the internalization process. With the help of this model, almost all knowledge management situations can be explained, though on a fairly abstract level

### 2.1.7. Project input and materials

Project Input refers to all physical and non-physical assets that are used as the basis for adding value to a given project and contributing to achieving project goals and objectives. It may take a variety of forms, from energy, process, technology, and the like to requirements, guidelines, capital, etc. Project input is transformed into certain output throughout the project life-cycle. Managing project input means identifying, estimating, and using physical and non-physical assets in the project to ensure that these assets are sufficient for making necessary changes within the project environment. The process of making the change to a project can be characterized by 4 variables:

- Input
- Resources
- Output
- Enablers

Project change is made when enablers (people, equipment, machines) transform input into desired output (product, service, some other results) through consuming available resources (money, time, technology). Project management appears to be a mechanism for managing these variables to ensure balanced use of resources and smooth transformation of inputs into outputs (Patrick, 2011).

### 2.1.8. Methods for minimizing construction project delays

Several researchers have proposed techniques for reducing construction project delays. Strong management teams, according to (Kumaraswamy, 1997), would be required to reduce time overruns by investigating site conditions and designing groundwork and foundations. They went on to say that building communication systems that linked all project teams was the most important strategy to deal with the problem.

The suggestion of the two approaches for reducing or eliminating time overruns that was investigated in Nigeria, The impact of delay on project delivery (Jagboro, 2002). Site activities were accelerated, and a contingency allowance was established.

Enforcing liquidated damage clauses, offering incentives for early completion, developing human resources through proper training and classification of craftsmen, and adopting a new approach to contract award procedures by giving less weight to prices and more weight to the

capabilities and past performance of contractors, and adopting new contracting approaches, such as design-build (Odeh, 2002).

In their research of delays in Florida, recommended that the Building Permit Approval Process be streamlined as much as possible (Ahmed, 2003). Changes in drawings, incomplete and incorrect specifications, and change orders must all be managed through proper design process management and fast decision-making.

The contractor's techniques for recouping delays. According to their survey, the most effective methods for enhancing production were working overtime hours or in shifts, followed by requesting a time extension (Abdul-Rahman, 2006). The proposed rescheduling activities within the available resources, hiring skilled personnel, and using subcontractors if the problem was a lack of resources. The respondent also agreed that site meetings are necessary for resolving issues, but that they should not be held too frequently.

## 2.2. Empirical review

For years several types of research have been undertaken on the reasons for construction project delays. Many studies have improved and adjusted many components and groupings that cause delays into other categories. It is common for construction projects to run into issues during their implementation, and one of the most common issues is a delay. Delay is a problem that should be effectively addressed before it sincerely and has a significant impact on project time, cost, and quality. Furthermore, it will contribute to a sour connection between the participants of the project.

In Saudi Arabia, research conducted about construction projects delay in different types of projects in the state. It was concluded that 70% of projects experience time overrun. The survey was conducted with 23 contractors, 19 consultants, and 15 owners. Seventy-three cause of delay was recognized and the causes are grouped into nine classes. The outcome of the survey that was agreed upon by all three parties is a change order. The overall results are stated that the factor related to labor, contractor, project, owner, and consultant is in the highest rank (Assaf, 2006).

The cause of delay in Malaysia about 150 respondents participated in the survey. This study identified the 10 most important causes of a delay from a list of 28 different causes and those are contractor’s improper planning, contractor poor site management, inadequate contractor experience, inadequate client finance and payments for completed work, problems with

subcontractors, shortage in material, labor supply, equipment availability and failure, lack of communication between parties, and mistakes during the construction stage. Also, the study identifies 6 different effects of delay (Sambasivan, 2007).

Delays in construction projects are a universal phenomenon. Delays happen to small and large projects in developing and developed nations and are usually accompanied by cost overruns. Delay generally has a harmful effect on clients, contractors, and consultants in terms of project progress, relationships, and communication among parties, and on financial aspects, which sometimes may develop into serious disputes or legal battles in court (Assaf, 2006).

The survey stated that the most significant cause of delay in the traditional type of contract, in perspective of contractor and consultant. It is also stated that to impart the economic feasibility of the capital project, extensive delays provide a fertile ground for costly disputes and claims. The result indicated the contractor and consultant agreed that owner interface, inadequate contractor experience, finance and payment, labor productivity, slow decision making, improper planning, and subcontractor are among the top ten important factors (Odeh, 2002).

The major causes of delay in building construction industries identified in Florida. The primary aim of this study is to identify the perception of different parties regarding the causes of delays, the allocation of responsibilities, and different types of delays. It was found that the consultants play a very important role in design-related delays because they are in charge of the design process in conjunction with the owner of the project (Ahmed, 2003).

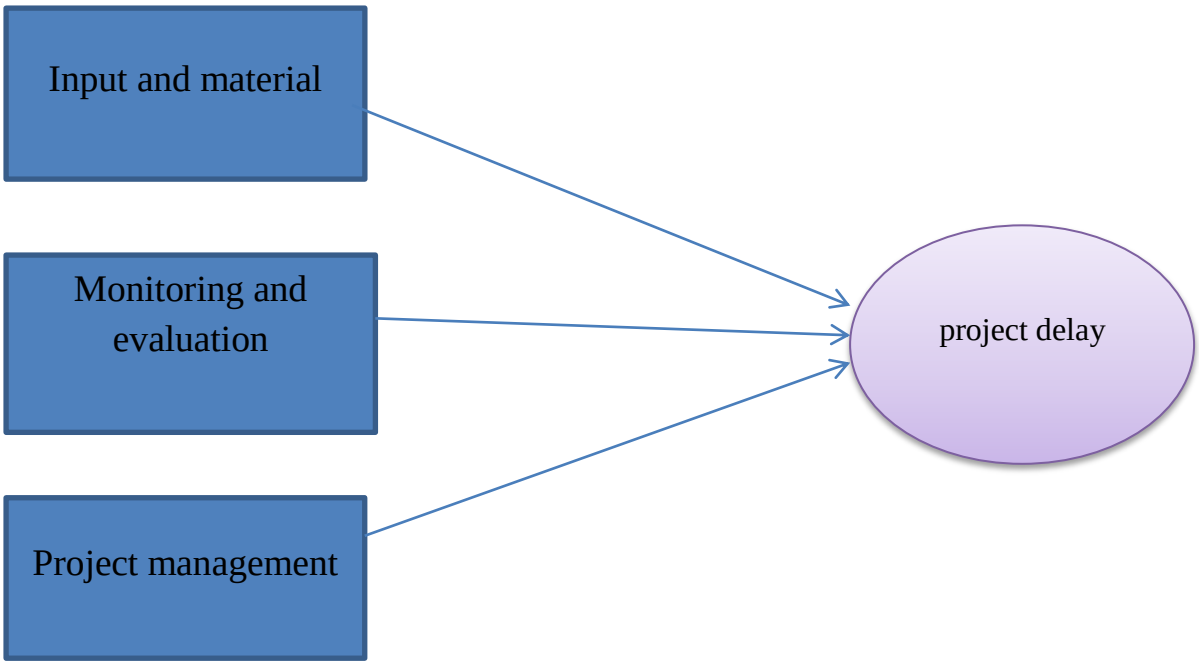
## 2.3. Conceptual FrameWork

Variables are measurable characteristic that assumes different values among the subjects. It is a variable that a researcher manipulates in order to determine its effect or influence on another variable while Independent variables also called predictor variable. In this case the independent variables are; Input and material related factor, Monitoring and evaluation related factor, and Project management related factors of project all predict the amount of variation that occurs in the dependent variable which is delay of building construction projects which is indicated by strength of the project.

The purpose of this section is to synthesize the ideas presented in the previous literature and to highlight the contribution to this research area. A lot of studies have been carried out on

construction delays and their consequences. For this study, the reasons for project delays are divided into three categories which have a potential to affect the performance of projects negatively or positively. If the performance of projects affected negatively the project would fall in to delay. The causes of project delay are listed in 3 categories for this specific study. The categories are: Input and material related factor, Monitoring and evaluation related factor, and Project management related factors.

**Figure 2.1 conceptual framework of the study**



# CHAPTER THREE
# RESEARCH METHODOLOGY

## 3.1. Introduction

This chapter deals with the methodology and procedures that were followed to determine the style and methods of collecting information and data from the study population through office and field sources. The study identified and ranked the factors that influence the duration of Yotek construction projects and their effects based on the results of all the reviewed studies. This chapter discusses research design, population, sample size and sampling design, data collection methods, validity and reliability of instrument, methods of data analysis as well as research ethics that was followed in the research.

## 3.2. Research Approach and Design

A mixed research approach was used, it includes both qualitative and quantitative research approaches. For analyzing the data gathered from the questionnaire, the researcher used the quantitative approach. Qualitative research is selected to find out facts about a concept, question, or attribute and involves the collection of numerical data to explain, predict, and control phenomena of interest. Besides the questionnaires, the researcher used the interview to collect the qualitative data. Quantitative analysis techniques help us to explore, present, describe and examine relationships and trends within our data (Saunders M. L., 2009). Questionnaires are found to be effective due to the relative easiness of obtaining standard data appropriate for achieving the objectives of this study. Questionnaires were framed for the survey based on the identified delay cause factors. Also, the researcher chose this method because is a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures (Creswell, 2003)

The research design followed an explanatory type of design. The emphasis of explanatory research is on studying a situation or a problem to explain the relationships between variables. The research was designed to get an opinion from Yotek construction concerning the factor causing delays and the effects of delays. The possible causes and effects of delays were identified from the literature reviews. A total of 28 delay-causing factors and six effects of projects were identified after thoroughly reviewing the literature and questions were designed according to these factors to get the opinion of Yotek construction.

## 3.3. Variables, Data Source, and Data Collection Methods

The study used three major causes of Project delay factors including: Monitoring and evaluation related factor, Input and material related factor, and project management related factor as predictor variables and project delay as dependent variable.

Data was gathered both from primary and secondary sources. Primary data was collected through questionnaires and interviews; the questionnaire was prepared for the employee in general which is the primary source. The secondary source of data was collected; secondary data is applied in the form of writing an examination of different published as well as unpublished organization documents.

The method of data collection which was employed in this study was a survey method; the survey research method was used for this research because it is an appropriate method for measuring respondents' opinions and attitudes. The primary data refers to the first-hand information gathered by the researcher. The information was collected in the survey by making use of questionnaires and interviews. The questionnaires were hand-delivered to respondents and collected likewise after being filled. The interview was conducted face to face at Yotek construction company's main office with the employees. The questionnaires were prepared on five-point Likert Scales ranging from strongly disagree to strongly agree. The value assigned are 1 =strongly disagree, 2 = disagree, 3 = no opinion, 4 = agree, 5 = strongly agree. The interview guide was contain semi-structured questions focusing on the causes of delayed construction. The interview will be used based on the assumption that the participants' perspectives are meaningful, they have the knowledge in the area and can make precise points, and their perspectives affect the success of the research.

The secondary data used in this research are information gathered through a literature review regarding delays in a construction project. Literature reviews were carried out to enhance the understanding of the theory regarding the research problem. The materials for literature reviews are such as books, articles, magazines, the internet, journals, documents, and other's research papers. The relevant information was used as a benchmark against primary data collected to support the research. The secondary source was then integrated with the primary source to ensure that the research is thorough enough to cover all aspects of the phenomena under investigation.

## 3.4. Population and sampling

The population is made of Yotek Construction Top management, engineers, consultants, Forman, and quantity surveyors with experience in the construction industry and currently involved in construction projects. More overall respondents had a high position; lengthy years of experience and educational background attended higher-level education imply the respondents have enough knowledge of the construction industry with issues relating to causes of delay.

At the time of conducting this research, Yotek construction has 15 ongoing projects. As Yamane stated for a larger population whose population size is known, the sample size can be determined using the following formula.

$n = N/1+N (e^2)$,

Where, n= sample size,

N= Population size, and

e= the margin of error (5%).

A level of confidence of 95% and a 0.05margin of error. By applying Yamane's equation a sample size of 83 is required for a population size of 106. Hence, a total of 83 questionnaires will be distributed to Top management, engineers, and consultants in Yotek Construction.

## 3.5. Sampling Techniques

In this study, respondents were selected based on their experience in Yotek construction experience, knowledge, and involvement. Stratified sampling was used first to select representative samples from Top management, engineers, and consultants, and then used simple random sampling method. Simple Random sampling Method is possible to mesure the errors of estimation or significance of results obtained from a random sample.

## 3.6. Methods of Data Analysis

The data analysis procedure includes the process of packaging the collected information putting it in order and structuring its main components in a way that the findings can be communicated easily and effectively and qualitative data is analyzed by interview and inferential deep insight about the question (Kombo, 2011). The data analysis was done using Microsoft Excel and SPSS software through.

**Descriptiv**e analysis techniques include measures of central tendency (e.g. mean), the measure of distributional shape (i.e., skewness )

**Inferential Analysis**( e.g. correlation, regression) and the results will be discussed in detail

**Correlation**:-it represent the strength of the connection between pair of connection that analyze positive (the two variable move in the same direction) and negative (move the variables move the opposite direction) correlation

**Regression**:-is describes how an independent variable is numerically related to the dependent variable and it reflects the impact of the unit change in the independent variable on the dependent variable. in this study I will use **multiple regression** because the independent variable is more than one The regression linear equation

$Y= \alpha+ \beta 1X1+\beta 2X2+ \beta 2X3+ \beta 2X4+e$ was used to show the extent to which the input and material, monitoring, and evaluation project management knowledge) Work Processes could explain the dependent variable (project delay ).

**Assumption tests** for multiple linear regression were required.so I used the assumption of linearity (scatterplot), assumption of independence, assumption of normality, and assumption of homoscedasticity and multicollinearity

The data was presented by using statistical tools like tables, figures, bar charts, line charts, pie charts, and others

## 3.7. Ethical Consideration

Each discipline should have its ethical guidelines regarding the treatment of human research participants (Johnston, 2009) Research ethics deals with how we treat those who participate in our studies and how we handle the data after we collect them. The researcher kept privacy (that left any personal questions), anonymity (protecting the identity of specific individuals from being known), and confidentiality or keeps the information confidential (Saunders M. L., 2007). Accordingly, the questionnaire will distribute to voluntary participants and will have a clear introduction and instruction parts regarding the purpose of the research

## 3.8. Validity and Reliability of the Instruments

Statistical validity also was used to measure the validity of the research through the use of correct statistical procedures and instruments (Neuman, 2007). The researcher first tried to address related and extensive literature to have complete data on the research topics. This comprehensive approach helps to ensure the face and content validity of the survey

instrument. The researcher reviewed extensive literature to develop questions for the survey. The instrument and research method were also revised and commented on by a professional advisor and expert before going to data collection. Moreover, to ensure the statistical validity of the study, the researcher collected quantitative data using a survey questionnaire and analyzed the data using correct statistical instruments like descriptive statistics, inferential statistics, correlation, and regression analysis to see the relationship between the variable and reach a concrete conclusion.

**Reliability** is an indication of how consistent the findings are based on the method of data collection and analysis. The most common method for testing the internal consistency of a scale for reliability is the Cronbach alpha coefficient (Hair, 1998). This is also supported by (Zikmund, 2010) scales with coefficient alpha between 0. 6and 0.7 indicate fair reliability. The consistency of major dimensions namely, input and material, monitoring and evaluation of project management knowledge was tested. The result of Cronbach's alpha laid in the acceptance range which is greater than 0.69.

Table 3.1validity and reliability

| Variables | Cronbach"s Alpha Coefficient | Number of Items |
|---|---|---|
| input and material | .957 | 5 |
| monitoring and evaluation | .961 | 5 |
| project management knowledge | .767 | 5 |
| Project delay | .972 | 5 |

Source own survey 2022

# CHAPTER FOUR

# RESULT ANDDISCUSSION

## 4.1. Introduction

The main objective of this study was to examine the causes of project delay in grade one construction companies: the case of YotekAddis Ababa.In this regard, this chapter presents the results and findings of the study as collected from the sample population. The data was gathered exclusively from a questionnaire as the research instrument. The questionnaire was designed in line with the objectives of the study. To enhance the quality of data obtained, Likert-type questions were included whereby respondents indicated the level of agreement to which the variables were practiced on a five-point Likert scale. Coded responses were entered into Statistical Package for the Social Sciences (SPSS) version 16, for data analysis. The data have been presented by tabulation and some figures. The chapter covers respondents' general information based on demographic information and findings based on how the research questions/objectives the results are presented and discussed

## 4.2. Data Analysis

In this part of the paper, the researcher attempts to present the practically observed facts about the causes of project delay in grade one construction companiesdata was collected from the manager, and contractor by using tools mentioned in the methodology part of chapter three. For this purpose, the researcher distributed questionnaires to 83 Respondents of which 65 the questionnaires were filled and returned to the researcher for analysis. In this chapter the data collected through questionnaire and are submitted for presentation and analysis. Then data was presented following the relevant data collecting, coding processing, analysis, and interpretation. The analysis and the interpretation were carried out based on the data collected througha questionnaire. Instruments that are used to present data are tools like tables, percentages, and charts, and figures are a customer for data presentation purposes as discussed below.

## 4.3.Descriptive analysis of general information of respondents

The descriptive statistical results are presented by tables, frequency distributions, and percentages to analyze the data and used to compute each variable in this study.

### 4.3.1.Response rate

As shown below table 1 selected sample by the formula taken from the book of (Kothari, 2004)is n=83 respondents from the managerial leaderand then questioner addressed to them However actually filled and returned respondents are 65 according tomale and 40 female total 25 returned this means 78.3 % response rate but the rest 21.7% not returned their response due to different reasons.

### 4.3.2.Discriptionof Respondents

**Table 4 1Discription of the respondent**

| | **Gender** | Frequency | Percent |
|---|---|---|---|
| | Male | 40 | 61.5 |
| | Female | 25 | 38.5 |
| | Total | 65 | 100 |
| | **Age** | | |
| | 18-30 years | 17 | 26.2 |
| | 31-40 years | 22 | 33.8 |
| | 41-50 years | 20 | 30.8 |
| | 51-60years | 6 | 9.2 |
| | Total | 65 | 100.0 |
| | **Educational status** | | |
| | Diploma | 15 | 23.1 |
| | Degree | 38 | 58.5 |
| | Master | 12 | 18.5 |
| | Total | 65 | 100 |
| | **Respondent Designation in the company** | | |
| | Client | 5 | 7.7 |
| | Contractor | 34 | 52.3 |
| | Consultant | 26 | 40 |
| | Total | 65 | 100 |
| | **Relevant working Experience** | | |
| | 1-5 year | 15 | 23.1 |

| | **Gender** | Frequency | Percent |
|---|---|---|---|
| | Male | 40 | 61.5 |
| | Female | 25 | 38.5 |
| | Total | 65 | 100 |
| | **Age** | | |
| | 18-30 years | 17 | 26.2 |
| | 31-40 years | 22 | 33.8 |
| | 41-50 years | 20 | 30.8 |
| | 51-60years | 6 | 9.2 |
| | 6-10 year | 16 | 24.6 |
| | 11-15 year | 19 | 29.4 |
| | 15 years | 15 | 23.1 |
| | Total | 65 | 100 |

Source: Own Survey data, 2022

Also,a large number of the respondents' age lies between 18-30years, 26.2 %.and the range from 31-40 years i.e33.8% and 41-50 is is30.8 small in numbers Table 4.4 Education of the respondentsThe education level 23% of the respondents are diploma and 58% of the respondents are degree holders, and about 18.5 are master's degree holders. From the respondent's profile, we can observe that the project manager is t user-friendly for those who have no academic qualifications.As it can be seen from the table above regarding the responsibility of respondents in the company 34(52.3%) of the respondents were clients, and 26(40%) of the respondents were consultants and contractors respectively. above presents the distribution of respondents in terms of respondent designation, Accordingly, respondents who are resident engineers were This implies that the majority of the respondents were Resident EngineersWhen looking at the tenure of respondents in the organization in the above table, .23% of the respondents have 1-5 years of experience in the company and these take the majority 24.6% of the respondents have 6-10 years and 11-15,above years are 29%.

## 4.4. Descriptive Analysis Of Case of Project Delay.

To see the general perception of the respondents regarding the examine causes of project delay in grade one construction companies: the case of YotekAddis Ababa.The researcher has summarized the measures with the respective means and standard deviations. Thus, the mean indicates to what extent the sample group averagely agrees or does not agree with the

different statements. The lower the mean, the more the respondents disagree with the statements. The higher the mean, the more the respondents agree with the statement. On the other hand, standard deviation shows the variability of an observed response from a single sample (Marczyk, 123-157).The mean values are presented below, together with standard deviation values for each variable. From 1 to 1.80 represents (strongly disagree), From 1.81 until 2.60 represents (do not agree),From 2.61 until 3.40 represents (true to some extent).From 3:41 until 4:20 represents (agree).From 4:21 until 5:00 represents (strongly agree )

### 4.4.1. Descriptive Statistics of Project management knowledge

Project management knowledge recorded a mean score of 3.8. Managers encourage staff involvement during decision making. Project managers can use knowledge from Better risk management from past projects variation mean scores of 3.72 were 0 .82 (standard deviation). it takes more than employing standard project management focus on communication mean of 3.86 and standard devation 0.747 and valuable practice knowledge Transfer across your project. This infers that on average the amount of variation between responses from the mean was significant and there is high dispersion to this notion among respondents

**Table 4 2Project management knowledge**

| Project management knowledge | N | Mean | Std. Deviation |
|---|---|---|---|
| Managers encourage staff involvement during decision making | 65 | 3.62 | .913 |
| Project managers can use knowledge of Better risk management from past projects | 65 | 3.72 | .82 |
| Knowledge management tools can help Higher employee productivity | 65 | 3.79 | .766 |
| it takes more than employing standard project management Focus on communication | 65 | 3.86 | .747 |
| valuable practice knowledge Transfer across your project. | 65 | 4.03 | .612 |
| Overall | | **3.8** | |

Source: own survey,2022

## 4.4.2. Descriptive Statistics of Monitoring and evaluation factors

**Monitoring and evaluation**- has a mean score of 4.05. Monitoring and evaluation practices are not given priority by the construction level are agreed to There is a lack of competent staff/skilled staff to carry out Monitoring and evaluation practices mean of 3.69. The observed standard deviation of 1.014 is les; therefore it inferred that there was a consensus among the project managers' inappropriate monitoring and evaluation implementation strategies are applied,tools can help Higher employee productivity and project success in the construction industryaccordingly the monitoring and evaluation the Monitoring and evaluation practices are not given priority by the at construction level is high mean value and standard deviation,

**Table 4 3Descriptive Statistics Monitoring and evaluation**

| Monitoring and evaluation factor | N | Mean | Std. Deviation |
|---|---|---|---|
| Monitoring and evaluation practices are not given priority the at the construction level | 65 | 4.03 | 1.03 |
| There is a lack of competent staff/skilled staff to carry out Monitoring and evaluation practices | 65 | 3.69 | 1.014 |
| Knowledge management tools can help Higher employee productivity | 65 | 3.89 | 1.161 |
| Inappropriate M&E implementation strategies are applied | 65 | 3.69 | 1.045 |
| Monitoring and evalution,can be used to,evaluate,the,achievement of | 65 | 4.11 | 1.017 |
| Overall | | **4.05** | |

Source: own survey,2022

## 4.4.3. Descriptive Statistics Input and material factor

**Input and material factor**- the mean score Input and material factor was found to be 3.88; Poor quality material 4.0 and standard deviation of 1.031 show that respondents are happy with Input and material factor. Shortage of construction material mean of 4.01 and standard deviation 1.053**,** The variation between responses from the mean is low which shows that

respondents agreed to this assentation minimize client complaints about late project delaine, enables a firm to provide quality services to construction Equipment availability and failure,Use proper and modern construction equipment,accordingly to these majority of the respondent is agree about the project delays in input and material.

**Table 4.4 Input material factor**

| Input and material factor | N | Mean | Std. Deviation |
|---|---|---|---|
| Poor quality material | 65 | 4.0 | 1.031 |
| Shortage of construction material | 65 | 4.01 | 1.053 |
| Equipment availability and failure | 65 | 4.05 | .909 |
| Use proper and modern construction equipment | 65 | 4.2 | .87 |
| Use appropriate construction method | 65 | 3.99 | .875 |
| **Overall** | | **3.88** | |

Source: own survey,2022

### 4.4.4. Descriptive summary of the case of project delay

Project management knowledge has a mean score of 3.8 and a standard deviation of .518. Monitoring and evaluation Mean 4.05 standard deviation 0.719. Project delay are agreed to the Project delay Input and material factor The observed standard deviation of 0.6304 is less than the mean 3.88, therefore, it inferred that there was a consensus among Project delay.

Table 4 5 Descriptive Summary case of project delay

| | N | Mean | Std. Deviation |
|---|---|---|---|
| Project management knowlodge | 65 | 3.8 | .518 |
| Monitoring and evaluation | 65 | 4.05 | .719 |
| Input and material factor | 65 | 3.88 | .6304 |
| Project delay | 65 | 3.81 | .408 |

Source own survey 2022

## 4.5.Inferential Statistics

In this section, the result of inferential statistics employed in the study supported on Pearson correlation coefficient, and multiple regressions were elaborated

## 4.5.1.Correlation analysis

To determine the significance level of the correlation and to evaluate and measure the strength of this Relationship, a Pearson Product Movement Correlation Coefficient was conducted with the result shown in the matrix below.

**Table 4.6 Interpretation of R**

| Interpretation of R | Description |
|---|---|
| 0.80 or higher | Very High |
| 0.6 to 0.8 | Strong |
| 0.4 to 0.6 | Moderate |
| 0.2 to 0.4 | Low |
| 0.2 or lower | Very Low |

Source:- own survey 2022

As per, a correlation coefficient enables quantifying the strength of the linear relationship between variables. This coefficient is usually represented by 'r' and can take only the value from -1 to +1. If r = +1 there is a perfect positive relationship between.

**Table 4.7 Correlation Analysis Matrix**

| | | **Project delay** |
|---|---|---|
| Project delay | Pearson Correlation | 1 |
| | Sig. (2-tailed) | |
| | N | 65 |
| Project managenentknowlodge | Pearson Correlation | 0.45 |
| | Sig. (2-tailed) | .000 |
| | N | 65 |
| Monitor and evaluation | Pearson Correlation | 0.732 |
| | Sig. (2-tailed) | .000 |
| | N | 65 |
| Input and material factor | Pearson Correlation | 0.599 |
| | Sig. (2-tailed) | .000 |
| | N | 65 |

Source: Own Survey, 2022

From the Pearson correlation analysis; project delay was found to have a strong positive correlation with the Monitoring and evaluation (r=.732; $p < 0.05$), Moreover, there is a srong positive relationship between Monitoring and evaluation, and a moderate relationship with Input and material factor. Which is statistically significant at a 95% confidence level. This implies that Input and material factor plays a significant role in project delay. Project management knowledge (r=.405; $p < 0.05$),This also implies that monitoring and evaluation ofthe Project play a significant role in determining the project delay followed by a strong positive correlation with the project delay  There is also a positive and strong correlation coefficient between and Monitoring and evaluation and Project delay relationship between these two variables such that the more, determines project delay. From this correlation, it can be concluded that due to the availability of good practice Monitoring and evaluation and Input and material factor, Project management knowledge enhances the practice of project delay.Generally, for all the independent variables the sign of the correlation is positive meaning that there is a positive relationship that indicates an increase or decrease in the project will also show an increase or decrease in the project delay.

## 4.6.Regression analysis

Regression analysis is a systematic method that can be used to investigate the effect of one or more predictor variables on the dependent variable. That is, it allows us to make statements about how well one or more independent variables predict the value of a dependent variable. Specifically, this multiple regression was conducted to investigate the causes of project delay in grade one construction companies: the case of Yotek Addis Ababa.

### 4.6.1. Assumptions Test

Multiple linear regression uses to estimate the effect of more than one independent variable over a dependent variable or it estimates the coefficient of determination on the predicted one explained by the predictors (Field, 2005). To have a valid multiple regressions analysis, several key assumptions should be satisfied. The key assumptions of Multiple Regression that are identified as a primary concern in the research include linearity, independence of errors (Autocorrelation), normality, and multicollinearity. For this study; each assumption was defined and assumptions were tested and the results of these assumptions were briefly summarized and presented below.

## Assumption 1: linearity

Some researchers argue that this assumption is the most important as it directly relates to the bias of the results of the whole analysis (Johnston, 2009). Multiple regressions assume a linear relationship between the independent and dependent variables. The bivariate plot of the predicted value against residuals can help us infer whether the relationship of the predictors to the outcome is linear. Hence; using visual inspection of the scatter plot, it can be suggested about the linearity. Looking at the scatter plot of each independent variable, it appears that the relationship of standardized predicted to residuals is roughly linear around zero. Hence, we can conclude that the relationship between the response or outcome variable and predictors is around zero suggesting that the relationships between these variables are linear

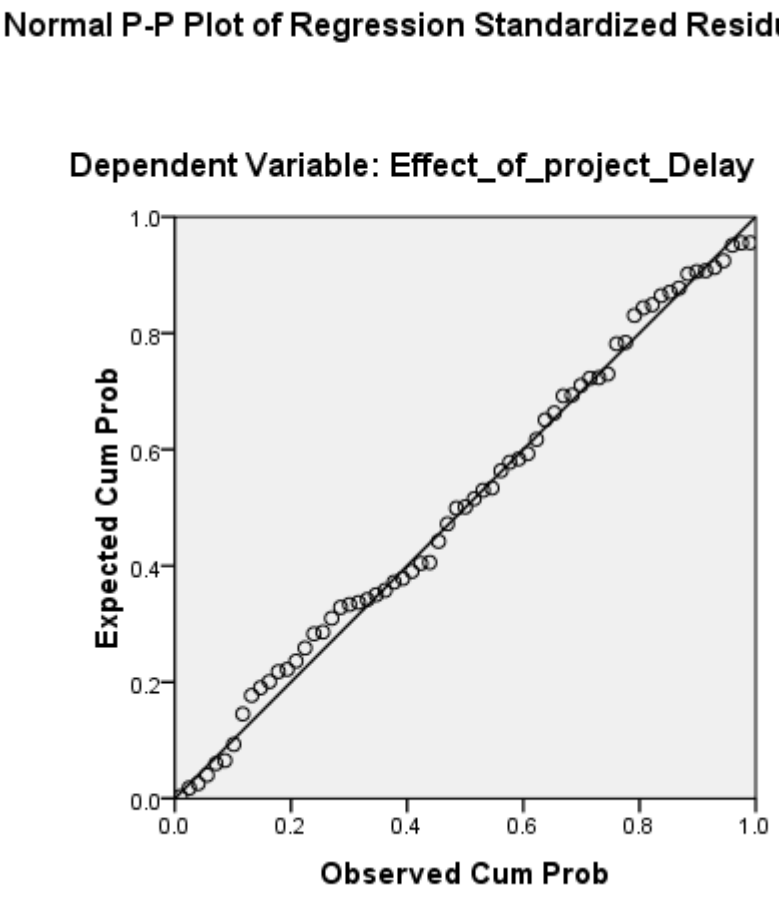



**Figure 1: P-P plot to check normality**

## Assumption 2:Multicollinearity

Multicollinearity occurs when several independent variables correlate at high levels with One another, or when one independent variable is a near-linear combination of other independent

Variables. If a correlation matrix demonstrates correlations of more than 0.8 among the independent variables, there may be a problem with multicollinearity. The other method is by computing tolerance values which measure the influence of one independent variable on all other independent variables and the Variance Inflation Factor (VIF) for each independent variable. Multicollinearity exists when Tolerance is below 0.1, and the average variance inflation factor (VIF) is greater than 10

**Table 4 8Multicolinearity test.**

| Model | | Collinearity Statistics | |
|---|---|---|---|
| | | Tolerance | VIF |
| | Project management knowledge | .996 | 1.004 |
| | Monitoring and evaluation | .897 | 1.115 |
| | Input and material factor | 0.9 | 1.111 |

Source: Own Survey

The above table displays the multicollinearity tests by computing tolerance values and Variance Inflation Factor (VIF) for each independent variable. In this case, all the tolerance values are greater than 0.10 and VIF is less than 10. Hence, the researcher assumed Multicollinearity was not a problem.

## Assumption 3: Normality

This assumption can be tested through histograms of the standardized residuals(Steven , 2009) Histograms are bar graphs of the residuals with a superimposed normal curve that showed distribution. Monitoring and evaluation and Project input and material factors curves are left with skewed distribution, this implies that the respondents' responses fall under agree and strongly agree with category, whereas, the project knowledge managementand graph showed relatively equal distribution on both sides. So, the residuals are normally distributed and the assumption was satisfied for the two independent variables.

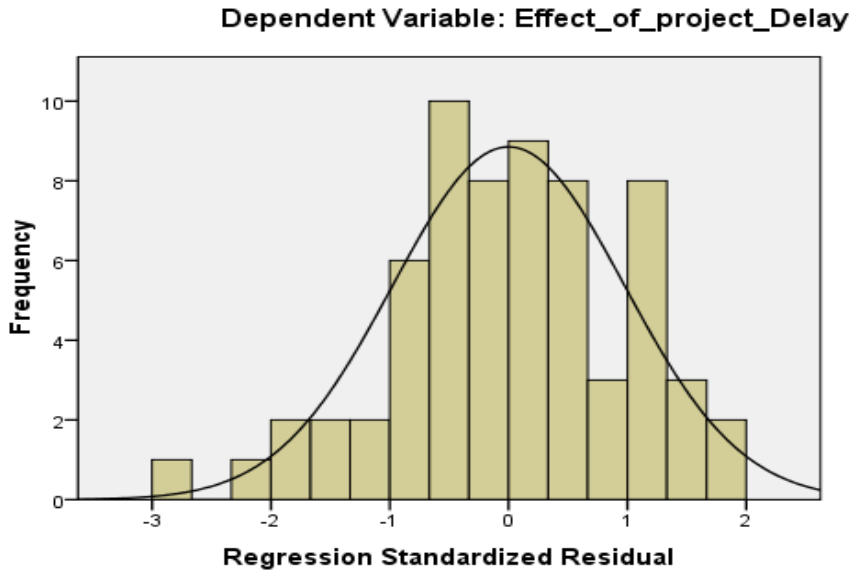



**Figure 2: Histogram to check the normality**

## Assumption 4: Independent of Residuals (Autocorrelation)

This is the same as saying that the observations (individual data points) are independent of one another (uncorrelated). The Durbin-Watson statistic is used to test for the independence of residuals. The value of the Durbin-Watson statistic ranges from 0 to 4. As a general rule, the residuals are independent (not correlated) if the Durbin-Watson value is approximately closer to 2, and values below 1 and above 3 are causes for concern and may render the analysis invalid. In this case, the Durbin Watson statistics showed (Durbin Watson= 2.256).hence the result falls between 1 and 3,the researcher assumed independence of residuals is satisfied

**Table 1: model summary**

| Model | R | R Square | Adjusted R Square | Durbin-Watso |
|---|---|---|---|---|
| 1 | .920 | .847 | .84 | 2 |

Source:- own survey (2022)

## 4.6.2.Regression Analysis

## Analysis of Variance (ANOVA)

The key purpose of the ANOVA test is to show whether the model is significantly better at predicting the dependent variable or using the means. Accordingly, Table indicates that the ANOVA is significant (F 3.002 df (regression) = 3, df (residuals) = 61, Sig<0.05). Hence, it

can be concluded that at least one of the three independent variables can be used to model the causes of project delay in grade one construction companies.

**Table 2: Overall model fir of the regressional model (ANOVA)**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 9.006 | 3 | 3.002 | 112.712 | .000 |
| | Residual | 1.625 | 61 | 0.027 | | |
| | Total | 10.630 | 64 | | | |

Source:- own survey (2022)

## Coefficient Determination

**Table 3: determination of coefficients**

| Model | R | R Square | Adjusted R Square | Durbin-Watson |
|---|---|---|---|---|
| 1 | .920 | .847 | .84 | 2.256 |

Source: own Survey (2022)

As the output from SPSS showed, the R Square describes the amount of variance explained by a set of predictor variables. In this study, the value is 0.847 which indicates that 84.7% of the variance in the dependent variable is explained by the independent variables in the model. Thus, the value of $R^2$ =84.7 shows that 84.7 % of project delaysare attributed to), monitoring and evaluation,input and material, and project knowledge management,15.3% of the variance is explained by variables that are not included in the model.

## 4.6.4. Multiple regression analysis

Multiple linear regressions are the most common form of regression analysis. As a predictive analysis, multiple linear regression is used to describe data and to when observing the sum effects of the predictors (monitoring and evaluation,input and material,project knowledge management) on project delay.The relative contribution of each of the different variables can easily be compared by taking the beta value under the standardized coefficients. The higher the beta value, the strongest its contribution becomes. From the table below, a two-tail test at a 95% confidence level ($\alpha$=0.05) showed that the positive beta values suggest a positive influence of the independent variables on the dependent variable.

**Table 4 9Multiple Regression Coefficient**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | Tolerance | VIF |
| 1 | (Constant) | 0.266 | 0.206 | | 0.203 | | |
| | Project manegmentknowledge | 0.316 | 0.039 | 0.402 | 0.000 | .996 | 1.004 |
| | Monitoring and evaluation | 0.328 | .030 | .0.579 | 0.000 | .897 | 1.115 |
| | Input and material | 0.262 | 0.034 | 0.404 | 0.000 | .900 | 1.111 |

a. Dependent Variable: project delay

**Source: own Survey, 2022**

Accordingly, the regression constant value showed that when the independent variables monitoring and evaluation,input and material, and project knowledge management) are constant at zero, project delay would be at a beta value of 0.266.While considering the degree to which the independent variables affect the dependent variable, the standardized coefficient results of monitoring and evaluation that is (Beta=0.328; P<0.05) makes the strongest unique contribution to explaining the dependent variable in which the results revealed that, a one-unit increase or positive change in monitoring and evaluation would lead to a 0.328 improvement in the level of project delay, followed by Project management knowledge (Beta=0.316, Sig 0.00 and P<0.05), it is implied that result project knowledge management, project monitoring, and evaluation, Input, and material,manage to have a significant effect on project delay and able to explain the changes in the increase of project delay by 31.6%, 32.8%, and 26.2% respectively. On the contrary, Input and material (β = 0.262, sig. 00, p<.0.05) has the weakest impact on project delay, and were somewhat weak in the context of the causes of project delay in grade one construction companies: the case of Yotek Addis Ababa.

### 4.6.5. Hypothesis Test

The proposed hypothesis was tested based on the results of the multiple regression analysis. By looking at the Sig.-value in table 4.15 it is possible to interpret whether the particular independent variable has a significant relationship with the dependent variables. The

hypothesis is supported when the Sig. value is smaller than 0.05; and a null hypothesis is rejected when the p-value is equal to or larger than 0.05 (Pallant, 2010).

**Hypothesis 1**

- **$H_1$: Project management knowledge** has a significant relationship and effect on project delay The regression coefficient result of Project management knowledgewas indicated as (β=0.316, P<0.05 as (Sig = 0.000, ) less than 0.05which implies, therefore, that Hypothesis 1 is accepted.

**Hypothesis 2**

- **$H_1$: Monitoring and evaluation** has a significant relationship and effect on project delay: Monitoring and evaluationregression coefficient result was defined with (β=0.328, P<0.05, sig. .001), is less than 0.05, therefore, the Hypothesis 2 is accepted**.**

**Hypothesis 3**

- **$H_1$: Input and material** has a significant relationship and effect on project delay: The regression coefficient result of Input and materialwas denoted as (β = .262, P<0.05, as Sig .00) is less than 0.05 and in. Thus, we can conclude from the results, that hypothesis 3 has been accepted

## 4.6.6.Regression Mathematical Model

The equation of multiple regressions in this study is generally built around two sets of variables, namely dependent variable (project delay ) and independent variables (monitoring and evaluation,input and material,project knowledge management). The basic objective of using regression equationsin this study is to make the researcher more effective at describing, understanding, predicting, and controlling the stated variables. Therefore, the model for the study was formulated as project delay, which is the dependent variable is the function of the independent variable i.e. effect of projectdelay '; hence; project delay again the function of the monitoring and evaluation,input and material,project knowledge management. It was therefore, the Regression Model used in the study was mathematically expressed as follows

Based on the multiple regression analysis, the following model summary was extracted to Conclude the variation between the variables as follows.

$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 2X3 + \beta 2X4 + e$

P D= 0.266 + 0.316(PMK) + 0.262 (IM) +0.328(M&E) ± 0.05,

**Where**

MKM = project knowledge management,

M&E=monitoring and evaluation

I M=input and material

β0 =Regression constant,

β1, β2, β3, β4 = coefficients of elasticity displaying degrees of explanation power about the case of project delay and

ε= model's error term.

This study is primarily aimed at analyzing the causes of delay of project Construction Project. The study identifies the perceptions of the major stakeholders (client, contractor, and consultant) who have a direct link to the issue of delays. Relevant works of literature have been used to identify the causes of project delay. To examinethese causes of delay this study has used questionnaires and interviews to gather appropriate data and to answer the research questions. The respondents included contractors, consultants, and client staff who engaged in the project accomplishment. To analyze the data, the severity index (SI) and frequency index (FI) was used to rank the perceptions of stakeholders. The product of the two indices was also employed to generate the Importance Index (II) to rank the overall degree of influence of the causes of delay to the project. The results have shown that the project has been delayed due to designing(preparing design without adequate information, slow in preparing the design, delay in approving the revised design, and frequent design change), planning & scoping(deficiency in planning and lack of scope definition); consultant related issues(slow in design revision &design approving, poor communication, drawing without detailed data),contractor related(ineffective planning and scheduling, poor schedule management, underestimating activity cost and duration, poor activity sequencing, poor resource planning, and poor time management);and the client related causes of delay such as slow in decision making, problem in contract administration, lack of skilled manpower, imposition of unrealistic contract duration & late issuance of change orders. The recommendations were forwarded to frontline players (client, consultant, and contractor) in a project to put their efforts into the project designing, planning & defining scope by the three stakeholders, as per their magnitudes of influence to realize how the project would be completed in stipulated budget and time.

# CHAPTER FIVE

# SUMMARY, CONCLUSION, AND RECOMMENDATION

## 5.1. SUMMARY

The main objective of this study was to investigate the causes of project delays in grade one construction companies. Specifically, the study attempted to examine causes of project delay in grade one construction companies, i.e(monitoring and evaluation,input and material factor, and project knowledge management). The findings derived from the data analyzed by using descriptive statistics, correlation, and regression are presented below

As shown below table 1 selected sample by the formula taken from the book of (Kothari, 2004) is n=83 respondents from the managerial leaderand then questioner addressed to them However actually filled and returned respondents are 65 according to male and 40 female total 25 returned this means 78.3 % response rate but the rest 21.7% not returned

Project management knowledge has a mean score of 3.8 and a standard deviation of 0.518. Monitoring and evaluation has a mean of 4.05 standard deviation 0.719, Project delay are agreed to the Project delay. Input and material factor observed standard deviation of 0.6304 and the mean of 3.88, therefore, it inferred that there was a consensus among Project delay.

From the Pearson correlation analysis; project delay was found to have a very high positive correlation with the Monitoring and evaluation ($r=0.732$; $p < 0.05$), Moreover, there is a positive relationship between Monitoring and evaluation and Input and material factor. Which is statistically significant at a 95% confidence level. This implies that Input and material factor plays a significant role in project delay. Project management knowledge ($r=.45$; $p < 0.05$),This also implies that monitoring and evaluation ofthe Project play a significant role in determining the project delay followed by a strong positive correlation with the project delay There is also a positive and strong correlation coefficient between Monitoring and evaluation and Project delay relationship between these two variables such that the more, determines project delay. From this correlation, it can be concluded that due to the availability of good practice Monitoring and evaluation and Input and material factor, Project management knowledge enhances the practice of project delay. Generally, for all the independent variables the sign of the correlation is positive meaning that there is a positive relationship that indicates an increase or decrease in the project will also show an increase or decrease in the project delay

Accordingly, the regression constant value showed that when the independent variables monitoring and evaluation,input and material, and project knowledge management are constant at zero, project delay would be at a beta value of 0.266.While considering the degree to which the independent variables affect the dependent variable, the standardized coefficient results of monitoring and evaluation that (Beta=0.328; P<0.05) makes the strongest unique contribution to explaining the dependent variable in which the results revealed that, a one-unit increase or positive change in monitoring and evaluation would lead to a 0.328 unit improvement in the level of project delay, followed Project project management knowledge (Beta=0.316, and P<0.05), it is implied that result project knowledge management, project monitoring, and evaluation, Input, and material,manage to have a significant effect on project delay and able to explain the changes in the increase of project delay by 31.6% and 32.8%, and 26.2% respectively. On the contrary, Input and material (β = .0262, sig. 00, p<.0.05) has the weakest impact on project delay, and were somewhat weak in the context of the causes of project delay in grade one construction companies: the case of YotekAddis Ababa

The results show that the type of construction delay that occurs most in the construction industries is usually excusable compensable followed by excusable non-compensable and concurrent.This study was aimed at finding the causes of delay in a large building construction project in construction industries., consultant-related factors, and contractors-related factors. The results revealed that the most important factors that cause a delay in the Yotek construction industries are financial predicament, lack of working knowledge, lack of consultant site staff, suspension of work by owner, inexperience on the part of the consultant, inexperience on the part of the consultant site staff, poor skills and inexperience of labor, material shortage, poor site management and lack of site contractors staff. The results further revealed that the most important state-of-the-art technology isthe labor input tracking model, of safety practice in construction and lean construction.

## 5.2.Conclusion

Following the literature review and the research data analyzed discussed in the previous chapters, this fourth chapter summarizes the main findings and the emerging issues from the study. Based on these findings, a conclusion was drawn and some recommendations were forwarded as some possible actions that can help manage the emerging issues. Contractual documents of road projects in the authority and correspondence letters, particularly permittedtime extension in reveal that delays occur in almost all construction projects and the magnitude of these delays varies considerably from project to project. Respondents also

forwarded the following delay causing factors with an open-ended questionnaire, besides the ranking factors. These are: having more than one project at a time led the contractors to lose their capacity, that in turn leads to delay in projects, technical competency of the client to administer the contract, and project managers, shortage of cash flow of contractors, limited budget of the client, shortage of resources, (finance, human, water, material), design problem (especially projects of force) weather condition are highly emphasized. Improper planning, poor communication between contractor and client, client and consultants, Lack of commitment of the client to alleviate decision making procedure, forward alternative solution, Change order, that arise due to design problem and additional work order, and Suspension of payments was among the main causes that contribute to delay according to the respondent's point of view.

The study found that there is a significant relationship ($p < 0.001$) between Monitoring and Evaluation Factors and successful project completion meaning that having good Monitoring and Evaluation enables the successful project completion in Yotek Construction.
The regression output revealed that Monitoring and Evaluation Factors havea positive and statistically significant impact on project performance. The correlation analysis also confirmed a positive and significant relationship. From this, it was concluded that as the suitability of Monitoring and Evaluation increases its leads to a correspondent increase in successful project completion.

## 5.3. RECOMMENDATIONS

The following recommendations should be considered by all major stakeholders involved in a construction project to reduce and control the reoccurring issues of the construction Yotek construction project in Addis Ababa.

- The most significant and influential variable affecting project completion time was found to be monitoring and evaluation, hence the project managers and clients should give their priority to improve the monitring and evaluation strategies and techniques they use.
- Factors of project management, monitoring and evaluaton, and input and material were all found to have a positive correlation on the project completion time, hence any improvement in any or all of these variables will positively impact the project completion duration. Therefore managers should work on improving the performance of these factors to minimize project delay.

- When we look at the rating of the three variables project management knowledge was rated the least, hence there should be an effort to improve the competence of managers through different trainings and developments.
- It is known that project delay has multidimensional effect on the overall project performance since it results in cost overrun, service delay and less quality, hence it should get proper attention and working to improve project knowledge management, monitoring and evaluation, and input and material.
- Lack of proper guidelines and improper planning have a serious effect on the successful complation of a project..

## 5.4. Future Research Direction

- This study dealt with the causes of project delays in grade one construction companies. (monitoring and evaluation,input and material,project knowledge management),These variables predict 84.7% of the variance. The remaining 15.3% of the variance is explained by variables that are not included in this study. Therefore, as far as the researcher is concerned, further research could target other variables to project delay.
- Due to time, cost and other limitations, the study is limited to a single construction company but future studies can get a better result by including different companies in different cities to get the cross sectional comparative results and also a time series data of each projects to get a longitudinal data.

## REFERENCES


Abdul-Rahman, B. B. (2006). Delay mitigation in the Malaysian construction industry. *Journal of construction engineering and management, 132*(2), 125-133.

Ahmed, A. C. (2002). *Construction delays in Florida: An empirical study. Final report.* Florida, US: Department of Community Affairs.

Ahmed, A. K. (2003). Delays in construction: a brief study of the Florida construction industry. *In Proceedings of the 39th Annual ASC Conference, Clemson University, Clemson, SC, 257*, p. 66.

Alaghbar, K. &. (2007). The significant factors causing delay of building construction projects in Malaysia. 192 - 206.

Al-Gahtani K, a. M. (2007). Total float management for delay analysis. *journal of Cost Engineering, 49*, 32 - 37.

Al-Najjar, J. M. (2008). *Factor Influencing Time and Cost Overruns on Construction Projects in Gaza Strip; (unpublished Thesis)* . The University of Gaza : A Thesis submitted in partial fulfilment of the requirement for degree of masters of science in Civil Engineering - Construction Management .

Assaf, A.-K. &.-H. (1995). Causes of delay in large building construction projects. *Journal of management in engineering, 11*(2), 45 - 50.

Assaf, S. A.-H. (2006). Cause of delay in Large Construction Projects. *International Journal of Project Management, 24*, 349 - 357.

Bekr, S. a. (2016). Causes and Effects of Delay in Public Construction Projects in Jordan. *American Journal of Engineering Research (AJER), 5*(5), 87-94.

Caletka, K. a. (2008). Delay analysis in construction contracts. *75*(1), 141 – 142.

Chafi, B. a. (2020). Empirical study of schedule delay in Moroccan construction projects. *nternational Journal of Construction Management*, 783-800.

Chappell D, M. D.-s. (2005). *Building Contract Dictionary.* London: Blackwell science.

Chappell, Marshall, Powell-smith & Cavender . (2005). *Building Contract Dictionary.* London: Blackwell science.

Creswell, J. (2003). *Research Design, Quantitative and Mixed Approach.* 2nd Ed.

Dinakar. (2014). Delay in Construction Project. *International journal of emerging technology and advanced engineering, 4*(5), 2250 - 2459.

Davenport, T. H. (1998). Successful knowledge management projects. *MIT Sloan Management Review, 2*(39), 43.

Divya, R. &. (2015). Causes, effects and minimization of delays in construction projects. *In Proc. Conf. on the Research in Communication, Computation, Electrical Science and Structures (NCRACCESS-2015)*, 47-53.

Field, A. P. (2005). Is the meta-analysis of correlation coefficients accurate when population correlations vary? *4*(10), 444.

Geiger, B. F. (2010). a collaborative project to enhance access to health information and services for individuals with disabilities. *Journal of health communication, 15*, 46 - 59.

Grumberg, S. L. (1997). *Construction Economics: An Introduction.* London: Macmillan Press Ltd.

Gupta, B. I. (2000). Knowledge management: practices and challenges. *Industrial Management & Data Systems, 100*, 17 - 21.

Hair, J. F. (1998). *Multivariate data analysis.*

Haseeb, M. X.-u.-D. (2011, December). Causes and Effects of Delays in Large Construction Projects of Pakistan. *Kuwait Chapter of Arabian Journal of Business and Management Review, 1*.

Hussien, A. a. (2002). Causes of construction delay: traditional contracts. *20*(1), 67 - 73.

Jacob, S. &. (2013). Significant causes and effects of project delays in the Niger delta region, Nigeria. *Southern African Institute of Industrial Engineering*.

Jagboro, A. &. (2002). The effects of construction delays on project delivery in Nigerian construction industry. *International journal of project management, 20*(8), 593-599.

Jana, A. A. (2015). Delays in Construction Projects: Causes and Mitigation. 1383 - 1389.

Johnston, D. D. (2009). Research methods for everyday life. *Blending qualitative and quantitative approaches*.

Kakwasi, G. (2013). Causes and effects of delay and disruptions in construction projects in Tanzania. *In Australasian Journal of Construction Economics and Building Conference Series, 1*, 52 - 59.

Kang. (2010). Causes, Effects and methods of minimizing Delays in construction projects. *Journal of Management in Engineering*, 312 - 332.

Kerzner, H. (2017). *Project management case studies.* John Wiley & Sons.

Kombo, D. K. (2011). *Proposal and Thesis Writing.* Nairobi: Pauline's publication Africa.

Koshe & Jha. (2016). Investigating Causes of Construction Delay in Ethiopian Construction Industries. *Journal of Civil, Construction and Environmental Engineering, 1*, 18 - 29.

Kothari, C. R. (2004). Research methodology. *Methods and techniques*.

Kotnour, T. (2000). Organizational learning practices in the project management environment. *International Journal of Quality & Reliability Management.*

Koushki, A.-R. &. (2005). Delays and cost increases in the construction of private residential projects in Kuwait. *Construction Management and Economics, 23*(3), 285-294.

Kumaraswamy, C. &. (1997). A comparative study of causes of time overruns in Hong Kong construction projects. *International Journal of project management, 15*(1), 55-63.

Levy, S. (2006). *Project Management in construction.* USA: McGraw Hill.

Marczyk, G. D. (123-157). General types of research designs and approaches. *Essentials of research design and methodology*.

Muhammed. (2015). *DELAYS IN CONSTRUCTION PROJECTS.*

Muhammed, T. A. (2015). *DELAYS IN CONSTRUCTION PROJECTS.*

Neuman, M. &. (2007). Conservation of the prolapsed uterus is a valid option: medium term results of a prospective comparative study with the posterior intravaginal slingoplasty operation. *International Urogynecology Journal, 18*(8), 889 - 893.

Nguyen, L. D. (2008). New Forensic Schedule Analysis Technique. *Journal of Construction Engineering and Management, 134*, 483-491.

Odeh, A. M. (2002). Causes of construction delay: traditional contracts. *International journal of project management, 1*(20), 67 - 73.

Omran, S. A. (2012). Project performance in sudan construction industry : A case study. *Academic Research journals, 1*, 55 - 78.

Patrick, G. (2011). *A guide to project monitoring & evaluation.* (Vol. 20). AuthorHouse.

Patrick, G. (2011). *A guide to project monitoring & evaluation.* AuthorHouse.

Rabbani, H. &. (2011). Problems of projects and effects of delays in the construction industry of Pakistan. *Australian journal of business and management research, 5*, 41-50.

Ramya, D. a. (2015). "Causes, effects and minimization of delays in construction projects.". *Proc. Conf. on the Research in Communication, Computation, Electrical Science and Structures (NCRACCESS-2015).*

Samarah & Bekr. (2016). Causes and effects of delay in public construction projects in Jordan. *American Journal of Engineering Research, 5*(5), 87-94.

Sambasivan, a. s. (2007). Causes and effects of delays in Malaysian construction industry. *International Journal of project management, 25*(5), 517-526.

Saunders, M. L. (2007). *Research methods* (Business Students 4th edition Pearson Education Limited ed.). England.

Saunders, M. L. (2009). *Research method for business students.* Person education ltd.

Simon, H. A. (2013). *Administrative behavior.* Simon and Schuster.

Steven . (2009). Applied Multivariate Statistics for social science. (5. Edition, Ed.) *Routledge*.

Sullivan A, F. (1986). Delays on large construction projects. *International Journal of Operations and Production Management, 6*, 25 - 33.

Tommy, F. a. (2006). Construction Delays in Hong Kong civil engineering projects. *JOURNAL OF CONSTRUCTION ENGINEERING AND MANAGEMENT, 132*(6), 639 - 649.

Trauner, M. L. (2009). *Construction Delays : Understanding Them Clearly, Analyzing Them Correctly.* London: Elsevier Inc.

Werku, K. K. (2016). Investigation Causes Of Constructtion Delay in Ethiopian Constructtion Industries. *Journal of Civil, Construction and Environmental Engineering, 1*, 18 - 29.

Yang, J. M. (2013). An empirical study of schedule delay causes based on Taiwan's litigation cases. *Project Management Journal, 44*, 21 - 31.

Zikmund, W. G. (2010). Exploring Marketing Research. *Mixed method research: Instruments, validity, reliability and reporting findings., 3*(2), 254 - 262.

# APPENDIX I

## ST. MARY'S UNIVERSITY

## SCHOOL OF GRADUATE STUDIES

## DEPARTMENT OF PROJECT MANAGEMENT

**Dear respondent**,

My name is Habtamu Aregay. I am currently doing my MA in project management at St. Mary`s University School of graduate studies. The purpose of this questionnaire is to gather data in order to study the cause of project delay in grade one construction companies. This questionnaire is to be filled by the clients, contractors, and consultants who are responsible for the project. Please co-operate by filling the questionnaire, because you're genuine, frank, and on-time response is vital for the success of my study. Besides, the data gathered by this questionnaire is purely for academic purposes and your response will be secured anonymously. I will be happy to share the findings of this research when it's completed.

Thank you in advance for taking your precious time to fill out this questionnaire. Please try to answer all the questions openly, as your answers will influence the outcome of the research.

Please don't write your name or any personal identifier on the questionnaire.

For any clarification needed please contact me on:

Habtamu Aregay

+251-991738502

habtishrooney@gmail.com

Thank you in advance, for your time

**Part I**: **General Information about Respondent's characteristics**

Please thick on the answer which describes you

1. Gender

   Male ☐ Female ☐

2. Age

   18-30 yrs ☐ 41-50 yrs ☐

   31-40 yrs ☐ 51-60 yrs ☐ Over 60 yrs ☐

3. Responsibility of state Respondent

   Client ☐ Contractor ☐ Consultant ☐

4. Respondent Designation in the company

   Owner ☐ Project Manager ☐ Site Engineer ☐

   Resident Engineer ☐ Supervisor ☐

   Other, specify _____

5. Level of Education

   Diploma ☐ 2 nd Degree ☐

   1st Degree ☐ PhD ☐

6. Relevant working Experience ( years)

   1-5 Years ☐ 11-15 years☐

   6-10 years ☐ Greater than 15 years ☐

**Part II- dependent variable and independent variable**

Please rank the delay causing factors below in what you consider to be encountered in a project based on the frequency of occurrence.

Please indicate on the boxes using the following criteria.

**Strongly agree(5), Agree(4), Neutral(3), Disagre(2), Strongly disagree(1)**

| No | Variables | Strongly agree(5) | Agree(4) | Neutral(3) | Disagree(2) | Strongly disagree(1) |
|---|---|---|---|---|---|---|
| | **Project knowledge management** | | | | | |
| **1** | There is established knowledge management system improved decision-making | | | | | |
| **2** | Project managers can use knowledge of better risk management from past projects | | | | | |
| **3** | Knowledge management tools can help Higher employee productivity | | | | | |
| **4** | it takes more than employing standard project management Focus on communication | | | | | |
| **5** | valuable practice knowledge Transfer across your project | | | | | |
| | **Monitoring and evaluation** | | | | | |
| **1** | Monitoring and evaluation practices are not given the priority that construction level | | | | | |
| **2** | There is a lack of competent staff/skilled staff to carry out Monitoring and evaluation practices | | | | | |
| **3** | Knowledge management tools can help higher employee productivity | | | | | |
| **4** | Inappropriate M&E implementation strategies are applied | | | | | |
| **5** | Monitoring and evaluation can be used to, | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | evaluate,the achievement of project objectives | | | | | |
| | **Input and material** | | | | | |
| **1** | Poor quality material | | | | | |
| **2** | Shortage of construction material | | | | | |
| **3** | Equipment availability and failure | | | | | |
| **4** | Use proper and modern construction equipment | | | | | |
| **5** | Use appropriate construction method | | | | | |
| | **Effect of project delay** | | | | | |
| **1** | Increase in the financial cost of the project | | | | | |
| **2** | time overrun of the projects | | | | | |
| **3** | Poor quality completed work | | | | | |
| **4** | Abandonment of building projects | | | | | |
| **5** | Dispute,between,parties,(client,contractor, consultant | | | | | |

# APPENDIX II

**ST. MARY'S UNIVERSITY**

**SCHOOL OF GRADUATE STUDIES**

**DEPARTMENT OF PROJECT MANAGEMENT**

## Interview question related to project delay

**Please comment on any issue you want to raise with respect to of project delay ----------**

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# APPENDIX III

## ST. MARY'S UNIVERSITY

## SCHOOL OF GRADUATE STUDIES

## DEPARTMENT OF PROJECT MANAGEMENT

A) General Information about Respondents

**Gender**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 40 | 61.5 | 61.5 | 61.5 |
| | Female | 25 | 38.5 | 38.5 | 100.0 |
| | Total | 65 | 100.0 | 100.0 | |

**Age**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 18-30 years | 17 | 26.2 | 26.2 | 26.2 |
| | 31-40 years | 22 | 33.8 | 33.8 | 60.0 |
| | 41-50 years | 20 | 30.8 | 30.8 | 90.8 |
| | 51-60 years | 6 | 9.2 | 9.2 | 100.0 |
| | Total | 65 | 100.0 | 100.0 | |

**Educational_status**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Diploma | 15 | 23.1 | 23.1 | 23.1 |
| | Degree | 38 | 58.5 | 58.5 | 81.5 |
| | Master | 12 | 18.5 | 18.5 | 100.0 |
| | Total | 65 | 100.0 | 100.0 | |

**Respondant_Desigination**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Client | 5 | 7.7 | 7.7 | 7.7 |
| | contractor | 34 | 52.3 | 52.3 | 60.0 |
| | consultant | 26 | 40.0 | 40.0 | 100.0 |
| | Total | 65 | 100.0 | 100.0 | |

**Work_Exprience**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1-5 years | 15 | 23.1 | 23.1 | 23.1 |
| | 6-10 years | 16 | 24.6 | 24.6 | 47.7 |
| | 11-15 years | 19 | 29.2 | 29.2 | 76.9 |
| | > 15 years | 15 | 23.1 | 23.1 | 100.0 |
| | Total | 65 | 100.0 | 100.0 | |

## B) Descriptive Analysis

## Descriptive Statistics of Project management knowledge

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| PKM_1 | 65 | 1.00 | 5.00 | 3.6154 | .91331 |
| PKM_2 | 65 | 2.00 | 5.00 | 3.7231 | .81983 |
| PKM_3 | 65 | 2.00 | 5.00 | 3.7692 | .76586 |
| PKM_4 | 65 | 2.00 | 5.00 | 3.8615 | .74743 |
| PKM_5 | 65 | 3.00 | 5.00 | 4.0308 | .61159 |
| Valid N (listwise) | 65 | | | | |

Descriptive Statistics Monitoring and evaluation

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| ME_1 | 65 | 2.00 | 5.00 | 4.0308 | 1.03031 |
| ME_2 | 65 | 2.00 | 5.00 | 3.6923 | 1.01432 |
| ME_3 | 65 | 2.00 | 5.00 | 3.8923 | 1.16086 |
| ME_4 | 65 | 1.00 | 5.00 | 3.6923 | 1.04468 |
| ME_5 | 65 | 2.00 | 5.00 | 4.1077 | 1.01740 |
| Valid N (listwise) | 65 | | | | |

Descriptive Statistics Input and material factor

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Input_material_1 | 65 | 2.00 | 5.00 | 4.0000 | 1.03078 |
| Input_materia_2 | 65 | 2.00 | 5.00 | 4.0154 | 1.05315 |
| Input_materia_3 | 65 | 2.00 | 5.00 | 4.0462 | .90882 |
| Input_materia_4 | 65 | 2.00 | 5.00 | 4.2000 | .86963 |
| Input_materia_5 | 65 | 2.00 | 5.00 | 3.9846 | .87486 |
| Valid N (listwise) | 65 | | | | |

Descriptive summary of the case of project delay

**Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| Effect_of_project_Delay | 3.8123 | .40755 | 65 |
| Project_Knowledge_management | 3.8000 | .51841 | 65 |
| Monitoing_Evaluation | 4.0492 | .71853 | 65 |
| Input_and_material | 3.8831 | .63037 | 65 |

C) Inferential Statistics

**Correlations**

| | | Effect_of_project_Delay | Project_Knowledge_management | Monitoing_Evaluation | Input_and_material |
|---|---|---|---|---|---|
| Pearson Correlation | Effect_of_project_Delay | 1.000 | .450 | .732 | .599 |
| | Project_Knowledge_management | .450 | 1.000 | .062 | .029 |
| | Monitoing_Evaluation | .732 | .062 | 1.000 | .316 |
| | Input_and_material | .599 | .029 | .316 | 1.000 |
| Sig. (1-tailed) | Effect_of_project_Delay | . | .000 | .000 | .000 |
| | Project_Knowledge_management | .000 | . | .312 | .410 |
| | Monitoing_Evaluation | .000 | .312 | . | .005 |
| | Input_and_material | .000 | .410 | .005 | . |
| N | Effect_of_project_Delay | 65 | 65 | 65 | 65 |
| | Project_Knowledge_management | 65 | 65 | 65 | 65 |
| | Monitoing_Evaluation | 65 | 65 | 65 | 65 |
| | Input_and_material | 65 | 65 | 65 | 65 |

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .920[a] | .847 | .840 | .16320 |

a. Predictors: (Constant), Input_and_material, Project_Knowledge_management, Monitoing_Evaluation

**ANOVA[b]**

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Regression | 9.006 | 3 | 3.002 | 112.712 | .000[a] |
| | Residual | 1.625 | 61 | .027 | | |
| | Total | 10.630 | 64 | | | |

a. Predictors: (Constant), Input_and_material, Project_Knowledge_management, Monitoing_Evaluation

b. Dependent Variable: Effect_of_project_Delay

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .266 | .206 | | 1.287 | .203 |
| | Project_Knowledge_management | .316 | .039 | .402 | 8.017 | .000 |
| | Monitoing_Evaluation | .328 | .030 | .579 | 10.958 | .000 |
| | Input_and_material | .262 | .034 | .404 | 7.665 | .000 |

a. Dependent Variable: Effect_of_project_Delay